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POLIOMYELITIS.

Buffalo.—During the week ended November 2 no case of poliomyelitis was reported in Buffalo. It appears that the outbreak is at an end. The last reported case had its onset on October 22. There have been investigated in Buffalo 288 cases of the disease during the past summer; of these 34, or approximately 12 per cent, terminated fatally.

TRACHOMA IN KENTUCKY.

A REPORT OF AN INVESTIGATION OF THE PREVALENCE OF TRACHOMA IN THE MOUNTAINS OF EASTERN KENTUCKY.

By JOHN McMULLEN, Passed Assistant Surgeon, United States Public Health Service.

Having been directed by the Surgeon General to investigate the prevalence of trachoma in Knott, Perry, and other counties in the State of Kentucky, I arrived at Louisville July 8, 1912. After a conference with Dr. J. N. McCormack, secretary of the State board of health, Dr. J. A. Stucky, of Lexington, and some of the health officers, it was decided that my investigations into the prevalence of trachoma should be begun at once in Knott County, and extended later to such other counties as might be deemed advisable.

In company with Dr. R. W. Duke, the county health officer, I arrived July 12, 1912, at Hindman, the county seat of Knott County, 20 miles from the nearest railroad and reached on horseback over very rough roads. Since my examinations were only for the purpose of determining the prevalence of trachoma, with insufficient* time for clinical work, it was a question as to how best to proceed in order to secure opportunity of examining a sufficient number of people.

I found the people much interested and willing to lend their assistance and hearty cooperation to any measure which might benefit the appalling numbers suffering from the "sore eyes" or "granulated lids," as trachoma is known there, and this was particularly true of the doctors of Knott County. The majority of the county schools were in session at this time, but none of the town schools, and it was decided to visit as many of the former as possible, in various sections of the counties, since some communities are much more heavily infected than are others, 60 to 75 per cent of families being infected in some neighborhoods. These schools could only be reached on horseback, as the roads are bad, often only the rocky beds of creeks.

The examination of four schools, which was the usual day's work, meant a ride of 20 or more miles. Many persons were examined along the roadside and in the homes in passing, and there was practically never any objection to having their eyes examined, as the people are well acquainted with "granular lids" and its fearful sequelæ, usually willing to discuss the subject, and always interested in learning matters pertaining to health.

The investigation included Knott, Perry, Leslie, Breathitt, Lee, Owsley, and Clark Counties, in the order named. All of these are in the mountains except Clark County, which is in the blue-grass region, but bordering on the mountain counties. A total of 3,974 people were examined, and 500 of them, or 12½ per cent, were found to be

suffering from trachoma in its various stages. The diagnosis of trachoma, for the purpose of this report, was made only in positive cases; those only suspicious were not included, but doubtless some of them were beginning trachoma. Corneal complications, pannus, etc., were very frequent.

Of the total number examined, 2,796 were school children from the mountain counties; 338, or about 12 per cent, had undoubted trachoma, while in Clark County, which is in the blue-grass region where living conditions are totally different, only 15 cases, or about 3 per cent were found affected among the 436 school children examined. A total of 3,232 school children were examined.

If conditions, as found in the child, are to be taken as an index of what is in the home, certainly a 12 per cent average of trachoma among the school children indicates an appalling amount of trachoma in the homes of these good and honest people in the mountains.

Dr. Stucky reports that in 1 mountain county he examined 100 cases in 2 days, 25 per cent of whom had trachoma, or some infectious disease of the eyes. Also in another mountain county he "examined over 200 cases; 25 per cent and more of these had trachoma. Many of them were the most pitiful and hopeless I had ever seen."

It is obvious that trachoma is plentiful, but it is difficult, outside of schools and public institutions, to secure the examination of sufficient numbers to give exact percentages. However, on the opening day of court week in a county seat I examined the eyes of 245 people in a routine manner, regardless of whether any diseased condition existed, and found that 45 of them, or about 18 per cent, had trachoma and about 10 per cent showed corneal complications. The majority of these were men, heads of families, attending court from all sections of that county.

In examining the eyes of school children it was my habit to request the teacher to write down the names of such pupils as had trachoma, and I was able in this manner to pick out entire families, as all usually had the disease. This list of trachoma cases was left with the teacher with the request that the parents be informed of the serious nature of this communicable disease. In many instances the teacher informed me that the worst cases of sore eyes were not in school that day and were often absent on account of "sore eyes." In one particular instance the teacher volunteered to send for the remainder of the children and produced seven of the worst cases of trachoma I had ever seen, much like the old "Egyptian ophthalmia" formerly seen among immigrants. The remainder of this family were either absent from home or the eyes were too acutely inflamed to make the trip to the schoolhouse possible.

KNOTT COUNTY.

In Knott County 12 schools were visited, 659 school children were examined, and 119 were found to have trachoma—more than 18 per cent or nearly 1 in 5. Two of the 12 teachers were found to have well-marked cases of trachoma. Outside of schools, 400 people were examined throughout the county and 102 cases of trachoma found among them. Some of these 400, however, were presented for examination because they were known to have sore eyes, which accounts

for this rather large percentage. A total of 1,059 people were examined in this county and 221, or about 20 per cent, were suffering from trachoma. The schools averaged from 2 to 44 per cent of trachoma, with a general average of about 18 per cent. It is estimated that from 8 to 10 per cent of the population (11,000 estimated) of this county are suffering from this disease, or about 900 cases of trachoma. This county was taken as a typical one for purposes of the investigation, and therefore more time was spent there and more people were examined than in any one of the other counties, the local doctors heartily cooperating and lending every aid in accomplishing the task.

PERRY COUNTY.

In Perry County 310 people were examined and 52 of them, or about 16 per cent, had trachoma. The great majority of these were school children. The population of Perry County is approximately 12,000, and it is estimated that about 7 per cent of them have trachoma, or about 800 cases in the county.

LESLIE COUNTY.

Owing to the fact that the teachers' institute was in session at Hyden, the county seat, no schools were in session during the time I visited this county. I examined the eyes of about 50 of the teachers and found 3 of them suffering from trachoma. The origin of each case was well known to the county health officer, as trachoma existed in the family. In company with the county health officer, Dr. Ray, I visited a section of the county known as Polls Creek, and there examined for a distance of several miles all the families of this neighborhood; 60 people were examined in this manner and 26 cases, or nearly one-half of all examined, had well-marked cases of trachoma, ranging from the acute infection among the small children to total blindness in adults. I was informed by Dr. Ray that this was the worst infected portion of the county, but evidently the disease existed in all sections, and we estimated that about 7 per cent of the population (approximately 9,000) of the county suffered from trachoma, or that about 600 cases existed.

BREATHITT COUNTY.

A total of 614 persons were examined in Breathitt County, and 77 were found to be suffering from trachoma, or more than 12 per cent. With a population of about 18,000 it is estimated that this county will furnish from 1,000 to 1,200 cases of trachoma.

LEE COUNTY.

A total of 12 schools in various sections of Lee County were visited, 668 pupils examined, and 57 positive cases of trachoma found, or about 8 per cent. The infection of the various schools varied from 2 per cent among the kindergarten and well-kept children to 25 per cent in rural districts among the people living in contracted spaces under insanitary conditions in sparsely populated neighborhoods. Lee County is near the blue-grass region.

OWSLEY COUNTY.

In Owsley County the teachers' institute was being held in the county seat of Booneville, and none of the schools was therefore in session. Dr. Mahaffey very kindly consented to examine some of the schools for me, and he informs me that he visited 8 schools, examined 600 persons, mostly school children, and found 2 cases of trachoma, or about 3 per cent. I examined about 100 people while riding through the county and found about the same percentage of trachoma. This county is near the blue-grass country and the last of the mountain counties investigated.

CLARK COUNTY.

For the purpose of comparison between the mountain counties and the neighboring blue-grass country, I visited Clark County, in the blue-grass region, visited 11 country schools, and examined 436 school children. Only about 3 per cent of these, or 15 cases of trachoma, were found.

Among the hundreds of cases of trachoma seen among these good and honest Anglo-Saxons of the mountains, I witnessed cases pathetic in the extreme. I saw small children shut up in darkened rooms even getting behind the room furnishings to shut out all light from the eyes, so intense was the photophobia. They probably had not seen daylight for weeks or even months, and these unfortunately are by no means isolated cases. In one school visited a number of the nearer neighbors were present, and there were cases of trachoma ranging from the acute onset in the small child to those cases in adults which had existed for a lifetime and had ended in the terminal cicatricial stage and total blindness. These are only instances of the many pathetic sights to be seen in these mountain counties as the result of this dangerous, infectious disease, which, without proper care and treatment, not only lasts throughout the lifetime of the individual, but makes victims of others and gains strength as it advances—certainly a terrible handicap to struggle against through life, only to pass their final days in darkness, a burden to themselves, their families, and their friends. They all give the same history of remissions and acute exacerbations.

To those who doubt the wisdom of classifying trachoma as a dangerous, communicable disease, it is suggested that they visit this disease as it exists in the mountains of eastern Kentucky (and doubtless also in the neighboring States where living conditions are the same)—the real trachoma, the "Egyptian ophthalmia"—and see what a great handicap it imposes upon its victims. There is a preponderance of evidence that it is infectious and will ultimately destroy the eyes, leaving its victim totally blind. Anything which destroys the most important of our senses must be considered as dangerous.

Dr. W. Cheatham, of Louisville, states that 75 per cent of untreated cases of trachoma result in blindness. The people who are suffering most from this disease are the poorer class natives of these mountain counties who live in simple, small cabins in the districts which are somewhat sparsely settled. Many of these natives are unlettered, but not ignorant. Large families are the rule, and 10 to 15 children in one family is not uncommon, the average being about 8. The cabin often consists of one room where they all sleep,

cook, eat, etc. They all use the same large family towel for days, and this is one of the great sources of infection. Some of these cabins have no windows, or they are so small as to be absolutely inadequate to provide the necessary ventilation, and, in winter, this same house is closed as tightly as its construction will permit. The only wonder is that the occupants enjoy as good health as they do.

Once the infection of a dangerous, infectious disease like trachoma is introduced there is every opportunity for its spread. It has apparently taken advantage of every opportunity and secured a firm hold which will prove a difficult, though not insurmountable, task to overcome. The family washbasin is often a large stone partially buried in the ground at the well, having a depression on top, which is practically impossible to thoroughly empty or clean. These mountain folks intermarry rather closely, suffer from the lack of sanitation, and their offspring are, therefore, too often mentally defective and the subjects of tuberculosis. The unkempt and neglected children of some of these inhabitants of the sparsely settled neighborhoods are an easy prey to the many ills with which they are unfortunately surrounded. Many of the children examined in the schools were suffering from errors of refraction, tinea tonsurans, enlarged tonsils with adenoids, and hookworm. They walk for miles over rough roads to attend school, and the schoolhouses, as a rule, are badly lighted and ventilated.

In some instances it appears that trachoma is contracted only after prolonged contact, but this depends upon the condition of the trachomatous eye, whether under treatment when the danger of infection is minimized, or whether the disease is quiescent or in a state of exacerbation. The amount of resistance possessed by the non-trachomatous eye is also a factor. Now that it is proposed to build new railroads through these mountains, making this country more accessible, the danger of the spread of this disease is more to be feared than ever, and accentuates the fact that it is time something was done to eradicate this communicable disease.

The infection of trachoma begins as an acute conjunctivitis. While this inflammatory condition may vary somewhat from the ordinary acute conjunctivitis, it requires observation and treatment, varying from several days to several weeks, before a positive diagnosis can be made. Under simple treatment ordinary conjunctivitis will subside in a short time, while the beginning trachoma will soon show the hypertrophy and present the raspberry-like appearance so characteristic of acute trachoma. Judging from some virulent cases of trachoma recently admitted to a local Baltimore hospital from the mountains of West Virginia, it is only fair to assume that the conditions found in eastern Kentucky would be found to prevail through the mountainous sections of the neighboring States or wherever the living conditions were the same and the infection had been introduced. The climate, altitude, etc., are not the reasons why this disease is found so plentifully here, but the manner of living in small cabins, and the fatal "family towel." Failure to treat the cases furnishes an ideal condition for the spread of the disease once the infection is introduced.

This mountain country is a beautiful region. The land is rich in coal and timber, and once these people become educated to the seriousness of the lack of sanitary living, to the value of fresh air,

individual clean linens, wash pans, and clean homes, human life will be prolonged and health and happiness augmented.

The source of the original infection is obscure, but trachoma has been present among the mountain people beyond the recollection of the oldest inhabitants.

The difficulty of eradicating trachoma is, of course, mainly due to the chronicity of the disease; but with perseverance and a determination never to let up until the end is accomplished, only success can come. This will, of course, require time and no little money, for whatever relief is furnished must be carried practically to their doors. These sturdy people do not ask charity, but unfortunately the majority of those suffering with the "sore eyes" have no means and live far from medical centers; but, given a fair opportunity, they will more than do their part.

Relief of the condition naturally falls under two heads: (1) Prevention of further spread of the disease, and (2) treatment of existing cases.

The first, or prevention, will be best accomplished by education. It will help them by teaching them to help themselves. The family towel must be eliminated and individual linen, basins, etc., be insisted upon. The importance of sanitation, clean homes, and fresh air must be shown. These things can be done by lectures accompanied with stereopticon views (showing right and wrong ways of doing things) in the schools and public buildings. These could well be supplemented by placing district nurses through the mountains to conduct nursing classes in the homes and schools. This work of prevention and cure must cover a very large territory and be so systematized as to neglect no neighborhood. The school children should be examined upon entering school, and all excluded who might convey communicable disease. Errors of refraction should be corrected, and this is an important detail in the treatment of trachoma. The schoolhouses should be so arranged as to give the best light and ventilation.

The cure of existing cases is a big problem and one that will require time and money. The semiannual clinic, so ably conducted by Dr. J. A. Stucky, of Lexington, under the auspices of the Woman's Christian Temperance Union Settlement School at Hindman, Knott County, is doing a splendid work, and the good results are to be seen there, but, of course, only a small portion of the trachomatous population is seen in this limited time. Clinics of this character should be established in all counties where the disease is found, and in various sections of each county, in order that no patient be overlooked, and a system of movable or field hospitals could be operated in this manner for those actually requiring surgical treatment. Patients so treated at these clinics could be taught the nature, seriousness, and contagiousness of their eye disease and how to prevent spreading it upon returning home. Accurate records should be kept of all cases, and district nurses should follow them up and see that the instructions are properly carried out. This clinic or movable field hospital should cover the same territory periodically in order to see again the former cases, and also any new ones which might be found, just as is being done in the hookworm dispensary system. During treatment the danger of infection is much lessened and finally a cure can be effected. By patience

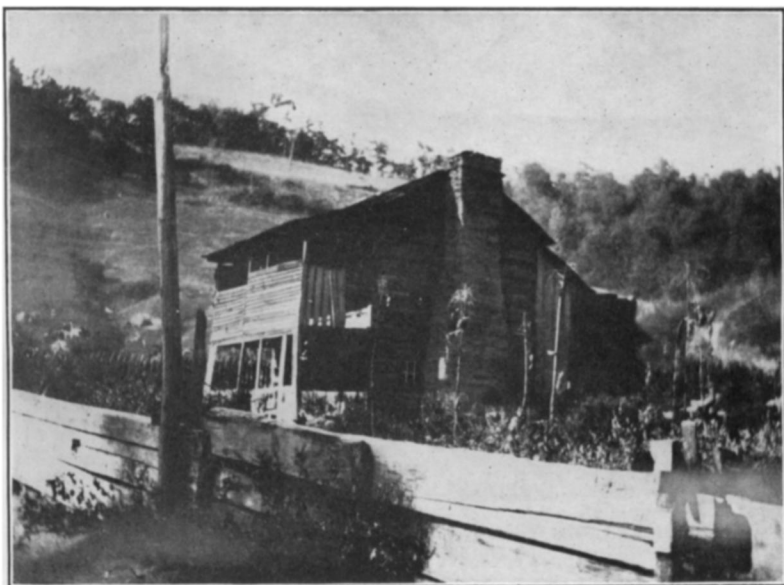


FIG. 1.—A MOUNTAIN CABIN IN KENTUCKY, SHOWING THE TYPE OF DWELLING IN THE REGION WHERE THE PREVALENCE OF TRACHOMA WAS INVESTIGATED BY THE UNITED STATES PUBLIC HEALTH SERVICE.

The window in the cabin is larger than that usually found.



FIG. 2.—A GROUP OF PERSONS AFFECTED WITH TRACHOMA PHOTOGRAPHED DURING THE INVESTIGATION INTO THE PREVALENCE OF THE DISEASE IN KENTUCKY BY THE UNITED STATES PUBLIC HEALTH SERVICE.

The ages of the patients range from a few years to old age. They were grouped for the purpose of being photographed, but the positions assumed were those naturally taken to shield the eyes from light.



FIG. 3.—TWO CASES OF TRACHOMA OF LONG STANDING IN CHILDREN, MET WITH DURING THE INVESTIGATION OF THE PREVALENCE OF TRACHOMA IN KENTUCKY BY THE UNITED STATES PUBLIC HEALTH SERVICE.

One of the patients has been almost blind for months.



FIG. 4.—TWO OTHER CASES MET WITH DURING THE INVESTIGATION OF THE PREVALENCE OF TRACHOMA IN KENTUCKY BY THE UNITED STATES PUBLIC HEALTH SERVICE.

These patients have had trachoma during most of their lives, and corneal complications were so severe that shielding the eyes from light had become habitual.

and unflagging perserverance this scourge can be removed and these mountain people given the opportunity which has heretofore been denied them by reason of this ever-present handicap, trachoma.

The economic consideration of this disease is thus discussed by Dr. W. Cheatham in his article on "Preventable blindness:"

In the entire United States there are 64,000 registered blind people, and it is a modest estimate that half of these are needlessly blind. The official census of New York in 1906 gives a total of 6,200 blind persons in the State. Of these the instances of preventable blindness numbered 1,084. Viewed solely from an economic standpoint it has been pointed out that the maintenance of her blind citizens costs the State of New York \$110,000 a year. If a blind citizen is dependent upon the State, it is estimated that his maintenance for life will cost the taxpayers at least \$10,000. Dr. Brown has told us that in the institution for the blind in Ohio 67 per cent of the inmates are there from trachoma. Dr. W. O. Bailey found, a year or so ago, in the Kentucky Institution for the Blind, 45 per cent of the inmates were blind of trachoma and 26.3 per cent from ophthalmia of the new born.

It is manifest from the foregoing that we must concede to trachoma a high place among the factors that go to decrease materially not only the economic efficiency of the individual sufferer, but that of the race of people, as a whole, among whom it is prevalent. In addition to the well-nigh constant bodily discomfort of the individual sufferer, the resulting visual impairment can not fail greatly to reduce his efficiency and consequently his value to society at large. The gradual increase in the prosperity of any community of the individual members of such community depends almost exclusively upon the ability to raise their own standard of living. Such improvement in their material condition is in turn dependent upon the productive capacity of the individual unit. One can hardly, therefore, urge that a person afflicted with a chronic disorder such as trachoma, which, in addition to the depression induced by the disease, tends to impair one of the most essential senses of the body, can be on a par in productive capacity with the healthy individual, apart from any danger to which he may expose the community at large by his ability to disseminate the disease.

It is thought that a sufficient number of people have been examined to give some idea of the prevalence of trachoma in the mountains of eastern Kentucky.

It is a pleasure to acknowledge my appreciation to Dr. J. N. McCormack, secretary State board of health, for his hearty cooperation and assistance. Also to Dr. J. A. Stucky, who is doing such splendid work in the mountains, I wish to express my sincere appreciation for his never-failing interest, cooperation, and timely suggestions. I also wish to acknowledge my appreciation to Drs. J. W. and R. W. Duke; Dr. Kelly and Dr. Pigman, of Knott County, for their untiring and valuable assistance; also to Drs. Ray and Collins, of Leslie County; Dr. Eversole, of Perry; Drs. Back, Arnold, and Hoge, of Breathitt; Dr. Evans, of Lee; Drs. Mahaffey, Glass, and Anderson, of Owsley; and Dr. Shirley, of Clark County. I also desire to express my appreciation to the teachers for their uniformly cordial reception and hearty cooperation in the examination of the pupils.

A FURTHER REPORT ON TRACHOMA IN KENTUCY.

By JOHN McMULLEN, Passed Assistant Surgeon, United States Public Health Service.

In accordance with instructions I returned to Kentucky and arrived in Lexington September 12, 1912, for the purpose of conferring with Dr. J. A. Stucky relative to the investigation and control of trachoma in the State, and also to accompany him to Knott County for the purpose of attending the semiannual clinics at Hindman.

These clinics are held in April and September by Dr. J. A. Stucky, medical director of the Woman's Christian Temperance Union Set-

tlement School at Hindman, Knott County, Ky. The clinics are principally for diseases of the eye, ear, nose, and throat, but all diseases are treated.

The clinic commenced September 16, and continued for four days. During this time 374 patients were examined, and of this number 113 were suffering from trachoma. Of the total number examined, 95 were resident pupils of the settlement school, 150 were day pupils living at home, and the remaining 129 came from this and the adjoining counties. More than 11 per cent of the resident pupils of the school had trachoma, and 16 per cent of the day pupils were suffering from this disease. About one-half of the outside people who came to the clinic were suffering from trachoma and sought relief from this disease and its sequelæ.

Of those suffering from trachoma 40 per cent had corneal complications, ranging anywhere from mild ground-glass appearance to the extreme degree of pannus and ulceration; 10 per cent had trichiasis; 25 per cent were suffering from photophobia; and 25 per cent had impaired vision, ranging anywhere from slightly defective vision to total blindness. The ages of these trachoma cases were all the way from small children to old age, and many of the old people had suffered from the disease the greater portion of their lives. Some of the cases at the clinic were seen on my previous visit in July and August, but many were new cases from counties I had not visited. The entire number comprising the clinic represented the average class of the native mountain people. They experience the exacerbations and remissions to which this disease is so prone in their little isolated mountain homes, with practically no medical aid save that rendered at these clinics and by the trained nurse connected with the settlement school.

All of these trachoma cases were treated at the clinic and given local applications to take home with them. Those requiring it were detained for a few days in the hospital tent before being sent home. Many of these patients live many miles distant, and their treatment will stop when their supply of medicine is exhausted. That trachoma has been present in these mountains for years is evidenced by the ravages of the disease, as seen in the eyes of the several generations attending the clinic at the same time. The large numbers of these people who came to the clinic as they did with their eyes shielded from the light by means of colored shades and glasses, dark cloths tied about their heads, etc., was extremely pathetic.

The time and means which Dr. Stucky is giving and the splendid work he is doing in the mountains entitle him to much praise and substantial encouragement. The field, however, is a very large one, and, in my opinion, one which will have to be dealt with in a very persistent and systematic manner.

It is difficult in advance to outline the details necessary for handling the existing cases and preventing the further spread of the disease, but the general plan as outlined in my previous report will, in my opinion, ultimately give the best results. Too much praise can not be given the Woman's Christian Temperance Union Settlement School at Hindman for the good work it has done and is still doing among the mountain people.